

PCT

WORLD INTELLECTUAL PROPERTY ORGANIZATION  
International Bureau



INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification <sup>6</sup> : A62C 3/02	A1	(11) International Publication Number: <b>WO 99/51305</b>
		(43) International Publication Date: 14 October 1999 (14.10.99)

(21) International Application Number: PCT/GR99/00014

(22) International Filing Date: 1 April 1999 (01.04.99)

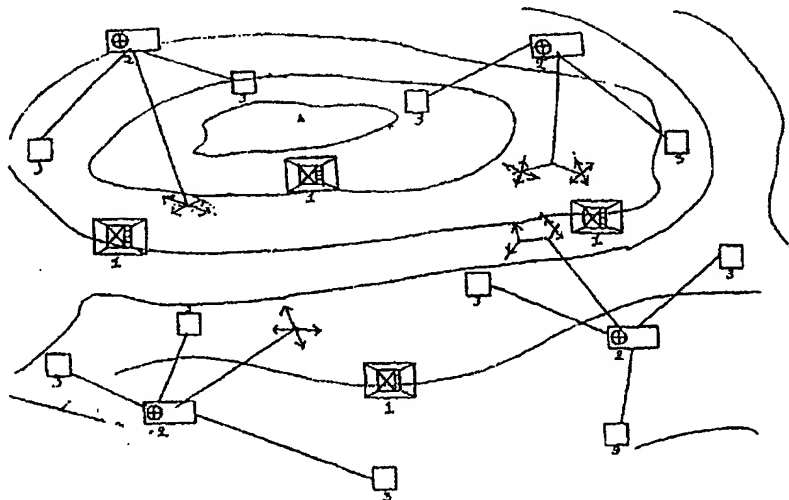
(30) Priority Data:  
.980100122 3 April 1998 (03.04.98) GR

(71)(72) Applicant and Inventor: VALLIANATOU, Venetia  
[GR/GR]; 51 Agias Sophias Street, GR-185 45 Pireaus  
(GR).

(81) Designated States: AU, CA, European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE).

Published  
With international search report.

(54) Title: SYSTEM FOR THE TIMELY EXTINCTION OF FIRES IN FORESTS, NATIONAL PARKS, ZOOLOGICAL GARDENS, ETC.



(57) Abstract

This system is a combination of electronics, computer, automation and drillings for water. It consists of: pillars (f.1) bearing a chamber equipped with a revolving video-camera with a lens, a thermal sensor of infrared radiation and photocell, a special computer processor bearing a special program and a transmitter. A series of scattered drillings (f.2) of water with corresponding pump rooms bearing a receiver, an electromagnet relay, an electric switch and a time switch. Pipes start from the drillings, at the end of which there is a branching with vertical revolving water sprinkler. The supply of electricity to the drillings comes from the mains-scattered reservoirs (f.3) connected to the drillings through ironpipes and bearing portable pressure pumps.

BEST AVAILABLE COPY

**FOR THE PURPOSES OF INFORMATION ONLY**

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT:

AL	Albania	ES	Spain	LS	Lesotho	SI	Slovenia
AM	Armenia	FI	Finland	LT	Lithuania	SK	Slovakia
AT	Austria	FR	France	LU	Luxembourg	SN	Senegal
AU	Australia	GA	Gabon	LV	Latvia	SZ	Swaziland
AZ	Azerbaijan	GB	United Kingdom	MC	Monaco	TD	Chad
BA	Bosnia and Herzegovina	GE	Georgia	MD	Republic of Moldova	TG	Togo
BB	Barbados	GH	Ghana	MG	Madagascar	TJ	Tajikistan
BE	Belgium	GN	Guinea	MK	The former Yugoslav Republic of Macedonia	TM	Turkmenistan
BF	Burkina Faso	GR	Greece	ML	Mali	TR	Turkey
BG	Bulgaria	HU	Hungary	MN	Mongolia	TT	Trinidad and Tobago
BJ	Benin	IE	Ireland	MR	Mauritania	UA	Ukraine
BR	Brazil	IL	Israel	MW	Malawi	UG	Uganda
BY	Belarus	IS	Iceland	MX	Mexico	US	United States of America
CA	Canada	IT	Italy	NE	Niger	UZ	Uzbekistan
CF	Central African Republic	JP	Japan	NL	Netherlands	VN	Viet Nam
CG	Congo	KE	Kenya	NO	Norway	YU	Yugoslavia
CH	Switzerland	KG	Kyrgyzstan	NZ	New Zealand	ZW	Zimbabwe
CI	Côte d'Ivoire	KP	Democratic People's Republic of Korea	PL	Poland		
CM	Cameroon	KR	Republic of Korea	PT	Portugal		
CN	China	KZ	Kazakhstan	RO	Romania		
CU	Cuba	LC	Saint Lucia	RU	Russian Federation		
CZ	Czech Republic	LI	Liechtenstein	SD	Sudan		
DE	Germany	LK	Sri Lanka	SE	Sweden		
DK	Denmark	LR	Liberia	SG	Singapore		
EE	Estonia						

## D e s c r i p t i o n

SYSTEM FOR THE TIMELY EXTINCTION OF FIRES IN FORESTS, NATIONAL PARKS, ZOOLOGICAL GARDENS, ETC.

During the past few years, more specifically since 1993 to  
5 present the extinction of forest fires all over the world,  
either by air ( aeroplanes, helicopters, etc.), or by land,  
( fire engines, forest guards, etc. ) has been very cumber-  
some. This is due to the many break out points of fire with  
devastating results, rendering at the same time human inter-  
10 vention very difficult.

The enormous destructions, such as those of Hollywood in 1995.  
New Castle, Australia in 1994, Sumatra, Borneo in 1998 were  
not only costly but claimed human lives as well.

15 In the most damaging cases, forest fires leave behind them  
barren land and upset the equilibrium of environmental eco  
systems.

Water bearing underground layers cannot be sufficiently en-  
20 riched by rain water- since there are no trees and roots -  
and this results in a universal reduction of agricultural pro-  
ducts.

The most important fact however is that such destructive forest  
25 fires create a thick layer of smoke bearing several particles.  
This smoke layer firstly hovers over the fire area but then ,  
depending on prevailing high winds, is transferred over popula-  
ted areas causing the death of many people as we all know.  
Needless to say that this litters the atmosphere excessively  
30 and destructively.

The usefulness, therefore, and necessity of timely forest fire  
extinction becomes imperative because of the above mentioned  
reasons.

For the confrontation of this great problem, a system of compu-  
35 ter science, automation and drillings (for water) is suggested.

The combination - planning consists of :

1. Cement pillars, higher than the tree height , scattered within  
the forest area. These pillars are equipped with a cement  
40 stair case leading to a small chamber (drawing 1 ).-

This chamber is equipped with several instruments such as a revolving video camera with a lens bearing a thermal sensor of infra red radiation and photo cell, a special electronic computer processor bearing a special program and a transmitter.

2. On the forest area ground there must be a series of drillings scattered around ( drawing 2 ) the depth of which varies according, to the morphology of the ground, as the supply of water from each drilling is always different.

10 Each drilling bears its pump room inside which there is a sign receiver an electromagnetic relay, an electric switch and a time switch.

In addition, each drilling is permanently connected, through a joint, with an iron pipe the length and cross section of which  
15 has been specified according to its supply of water.

At the end of the iron pipe there is a branching in two different directions approximately 20 meters in length each.

Each branch is connected - through a joint ( head ) with a revolving sprinkler installed vertically to the branch,  
20 and the height of which varies according the height of the trees and ground morphology. The sprinklers must be grounded (earthed). Outside each pump room there must be a pylon on the upper part of which a plate has been placed with an anemometer (with gauge) and a wind indicator so that the direction and intensity of wind  
25 can be observed.

3. More over in the forest areas (drawing 3) there must be scattered reservoirs connected to the drilling through an iron pipe. These reservoirs must always be full of water and the distances between one another should vary according to the supply of water  
30 from the drilling. They should also carry portable pressure pumps

The supply of electric energy to the instruments housed in the cement pillars is done by batteries of nominal strength. In the more inaccessible areas the charging of batteries is effected by a accumulator Panel of photovoltaic energy ( conversion  
35 of solar energy to electrical ).

In the drillings themselves, the supply of electric energy is done by electric current ( that of towns and cities ) via underground cables. This does not exclude the on land supply

of electric energy in inaccessible areas.

How the system operates :

5 In the cementpillars, as soon as the revolving video-camera  
teledetects the thermal incident, the infrated radiation  
through a photocall is converted to an electric sign ante-  
ring the processor of the electronic computer which in turn  
processes, filtrates the noises of the sign and if the sign  
exceeds the threshold allowed for the manifestation of an  
10 incident ( fire ), then it channels the net sign to the trans-  
mitter, inside the chamber.

The transmitter then modulates and wirelessly transmits  
the sign of a specific frequency to the receiver of the pump  
15 house of the drilling.

The receiver will amplify it and convert it to electric  
current capable to put into operation the electromagnetic  
Relay of the pump house, and via the electrical switch  
the pump of the drilling is set into operation. The pumped  
20 up water is delivered to the ironpipes at the end of  
which it is distributed through branching in two dire -  
ctions and finally it is launched through the revolving  
water sprinklers for the extinction of the fire.

## Requirements / Claims

System of timely extinction fire forests, Nationals Parks,  
Zoologicals Gardens, etc.

## 5 Claim/Req. 1.

On land planning consists of :

A. Cement pillars (dr.1-) in the chamber of which these is :

- 1) A revolving video-camera with a lens, a thermal sensor of  
infra red radiation and a photocell.
- 10 2) A Special electronic computer Processor bearing a special  
system .
- 3) A transmitter

B. A layout of drillings (dr.2 ) with their corresponding pump-  
rooms which are equipped with :

- 15 1) A sign receiver
- 2) An electromagnetic Relay
- 3) An electric switch
- 4) A time switch

Each drilling is permanently connected through a joint to  
20 an hotizontal ironpipe the length and cross section of which  
depends on its supply of water. At the end of the pipe  
there is a branching which through a joint is connected to  
the water sprinkler. The said sprinkler is installed verti-  
cally to the branch and in a hight corresponding to the tree  
25 coverage and ground morphology.

The sprinklers are grounded ( earthed ).

C. The supply of electric current to all pillar instruments  
(videocamera, computer, transmitter ) as well as to the pump  
rooms (sign receiver, electromagnetic Relay and electric  
switch except the drillings ; is done by batteries of nominal  
30 strength. In the more inaccessible areas of the cementpillars  
the charging of batteries is done by a panel of photovol-  
taic energy ( conversion of solar energy to electric one ) .  
The supply of electricity to the drilling pumps is done by  
alternating current from electricity stations, the cables  
35 of which reach the drillings underground.

D. Outside the pumprooms there is a pylon on the plate of  
which there is an anemometer and a wind indicator so that

the direction and intensity of the wind can be known.

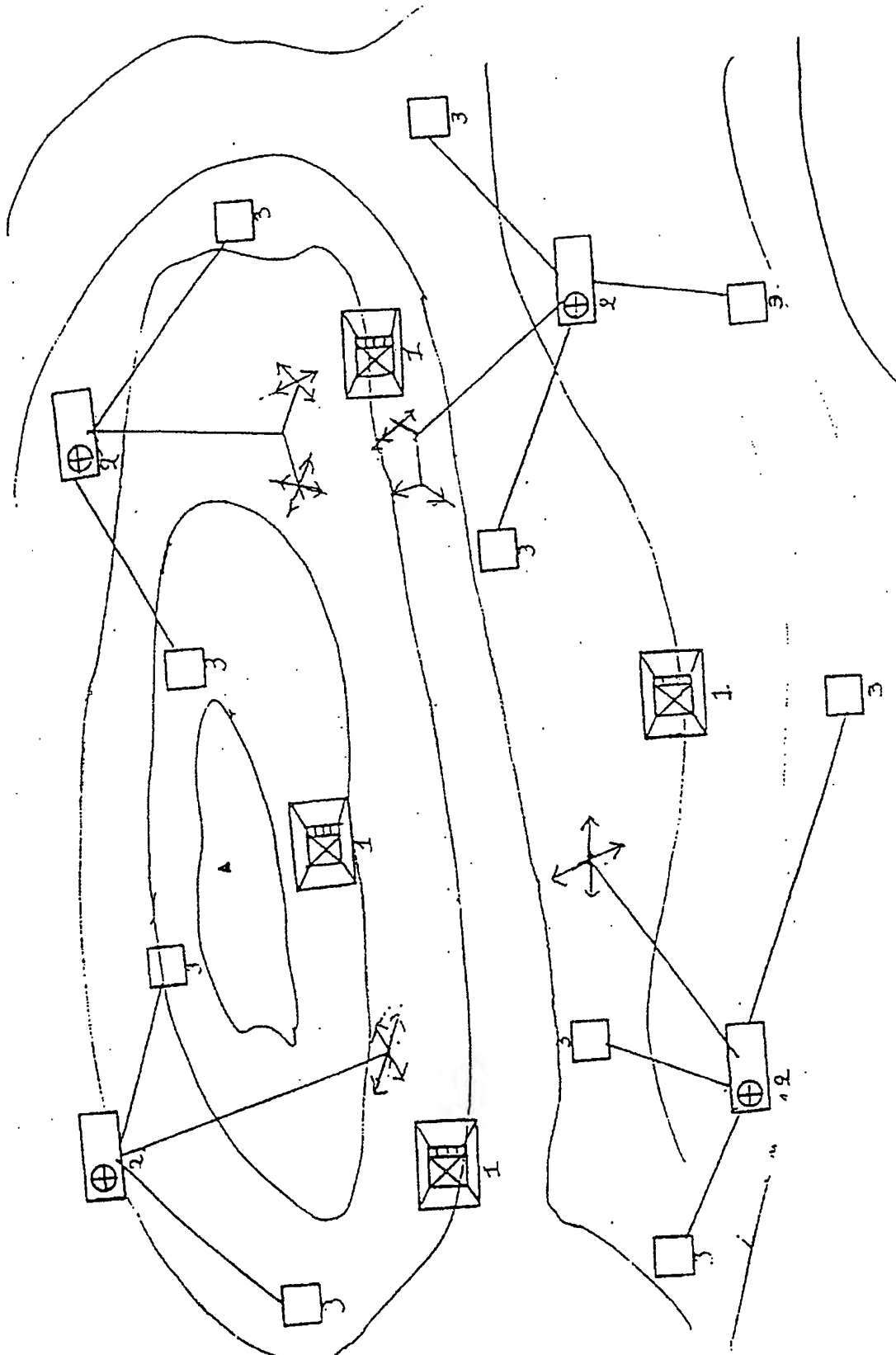
- 5 E. Water reservoirs connected to the drillings (dr.2) with iron-pipe so that they can be fed with water. These reservoirs bear portable pressure pumps connected with a gasoline engine or a petrol motor. The reservoirs are always full of water, scattered and of various capacities.

Claim/Req. II.

- 40 The water reservoirs, as mentioned in Req. I can be used independently (by themselves) in case of need or system blockage.

Claim/Req. III. Way the system operates

- 15 As mentioned in Req. I the system operates as follows :  
As soon as the revolving videocamera in the cement pillars teledetects the thermal incident, the infra red radiation through the photocell is converted to an electric sign which enters the processor of the special electronic computer which in turn processes and filtrates the noises of the sign.  
20 If the sign exceeds the threshold ( limits ) allowed for the manifestation of an incident ( fire ) the Processor channels the net sign to the transmitter inside the chamber.  
25 The transmitter in turn modulates and transmits the sign of specific frequency wirelessly to the receiver of the pumproom in the drilling. The receiver will amplify it and convert it to electric current capable of putting into operation the electromagnetic relay of the pump room.  
30 The relay through an electric switch puts into operation the pump of the drilling. The water pumped from the drilling is delivered to the ironpipes at the end of which it is distributed through branching in two directions and finally it is launched through the  
35 two revolving water sprinklers for the extinction of the fire.



# INTERNATIONAL SEARCH REPORT

Int lional Application No

PCT/GR 99/00014

A. CLASSIFICATION OF SUBJECT MATTER  
IPC 6 A62C3/02

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 6 A62C

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	FR 2 696 939 A (BERTIN & CIE SA) 22 April 1994 see the whole document ---	1-3
A	WO 91 09649 A (LEJOSNE) 11 July 1991 see page 5, line 1 - page 9, line 17; figures ---	1-3
A	EP 0 623 365 A (KAIDONIS) 9 November 1994 see column 3, line 23 - column 5, line 19; figure ---	1-3
A	FR 2 565 497 A (LEJOSNE) 13 December 1985 see page 2, line 20 - page 6, line 34; figures -----	1-3

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

### \* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search

23 June 1999

Date of mailing of the international search report

02/07/1999

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2  
NL - 2280 HV Rijswijk  
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,  
Fax: (+31-70) 340-3016

Authorized officer

Triantaphillou, P

# INTERNATIONAL SEARCH REPORT

information on patent family members

International Application No

PCT/GR 99/00014

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
FR 2696939	A	22-04-1994	WO 9408660 A	28-04-1994
WO 9109649	A	11-07-1991	FR 2656802 A	12-07-1991
			AU 7056291 A	24-07-1991
			IT 1244986 B	13-09-1994
EP 623365	A	09-11-1994	FR 2704777 A	10-11-1994
			AT 150328 T	15-04-1997
			DE 69402099 D	24-04-1997
			DE 69402099 T	26-06-1997
			ES 2101456 T	01-07-1997
			GR 3023700 T	30-09-1997
FR 2565497	A	13-12-1985	NONE	

**This Page is Inserted by IFW Indexing and Scanning  
Operations and is not part of the Official Record**

**BEST AVAILABLE IMAGES**

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images include but are not limited to the items checked:

- ☐ **BLACK BORDERS**
- ☐ **IMAGE CUT OFF AT TOP, BOTTOM OR SIDES**
- ☐ **FADED TEXT OR DRAWING**
- ☐ **BLURRED OR ILLEGIBLE TEXT OR DRAWING**
- ☐ **SKEWED/SLANTED IMAGES**
- ☐ **COLOR OR BLACK AND WHITE PHOTOGRAPHS**
- ☐ **GRAY SCALE DOCUMENTS**
- ☐ **LINES OR MARKS ON ORIGINAL DOCUMENT**
- ☐ **REFERENCE(S) OR EXHIBIT(S) SUBMITTED ARE POOR QUALITY**
- ☐ **OTHER:** \_\_\_\_\_

**IMAGES ARE BEST AVAILABLE COPY.**

**As rescanning these documents will not correct the image problems checked, please do not report these problems to the IFW Image Problem Mailbox.**